



Newtown Health District  
[Blastlyme.org](http://Blastlyme.org)

# Which tick-borne diseases should we be concerned about?

Several diseases can be acquired from the bite of an infected blacklegged (deer) tick:

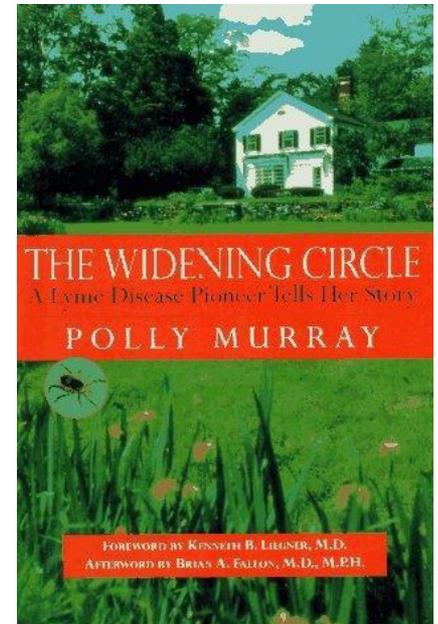
- Lyme Disease
- Babesiosis
- Anaplasmosis
- *Borrelia miyamotoi*
- Powassan Disease



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PHOTOGRAPH BY JIM GATHANY, CDC/PHIL/CORBIS

# Named after first cases in Lyme, CT (1975)



Photograph by Michael Patnaude, University of Florida.

# Lyme disease in the United States

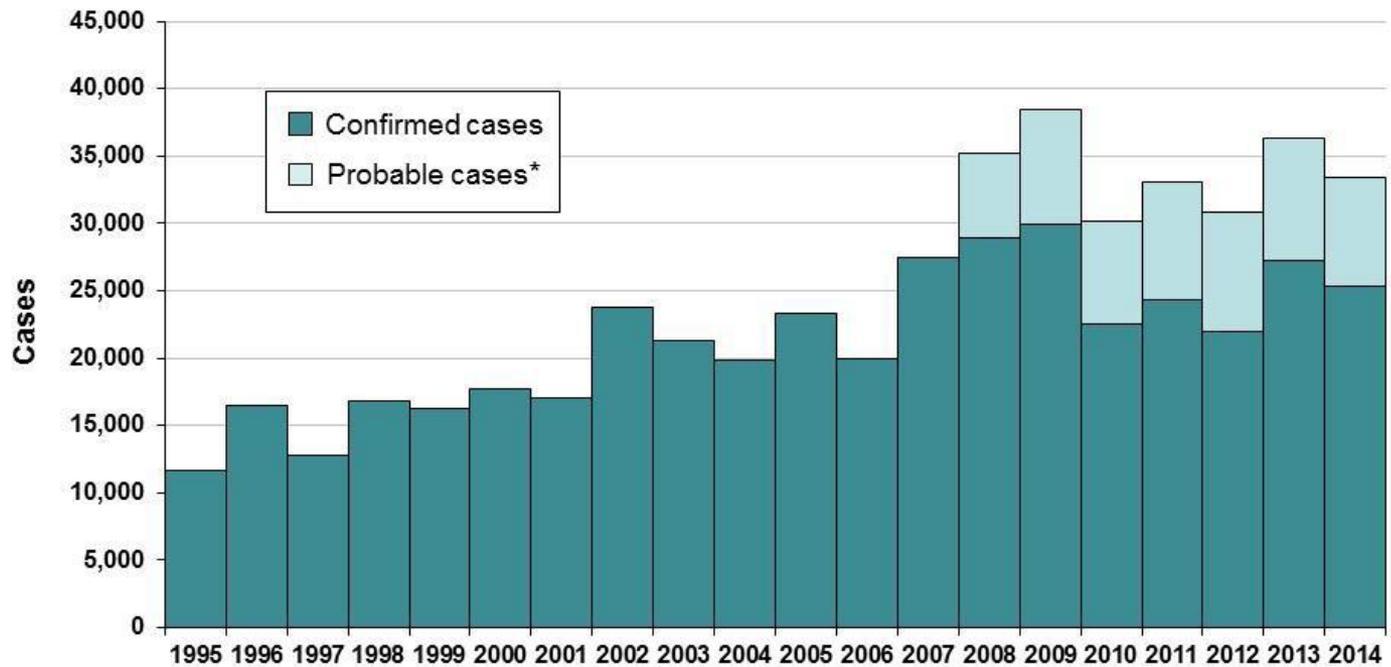
According to the CDC, Lyme disease is the most commonly reported vector-borne illness in the United States with more than 300,000 new cases annually.

In 2014, it was the 5<sup>th</sup> most common nationally reportable disease with 96% of confirmed cases reported from 14 states:

**Connecticut**  
**New York**  
**Pennsylvania**  
**Rhode Island**  
**Virginia**  
**Wisconsin**  
**Massachusetts**

**Delaware**  
**Maine**  
**Maryland**  
**Vermont**  
**New Jersey**  
**New Hampshire**  
**Minnesota**

# Lyme disease is on the rise.



# Lyme disease cases 2001

Reported Cases of Lyme Disease -- United States, 2001

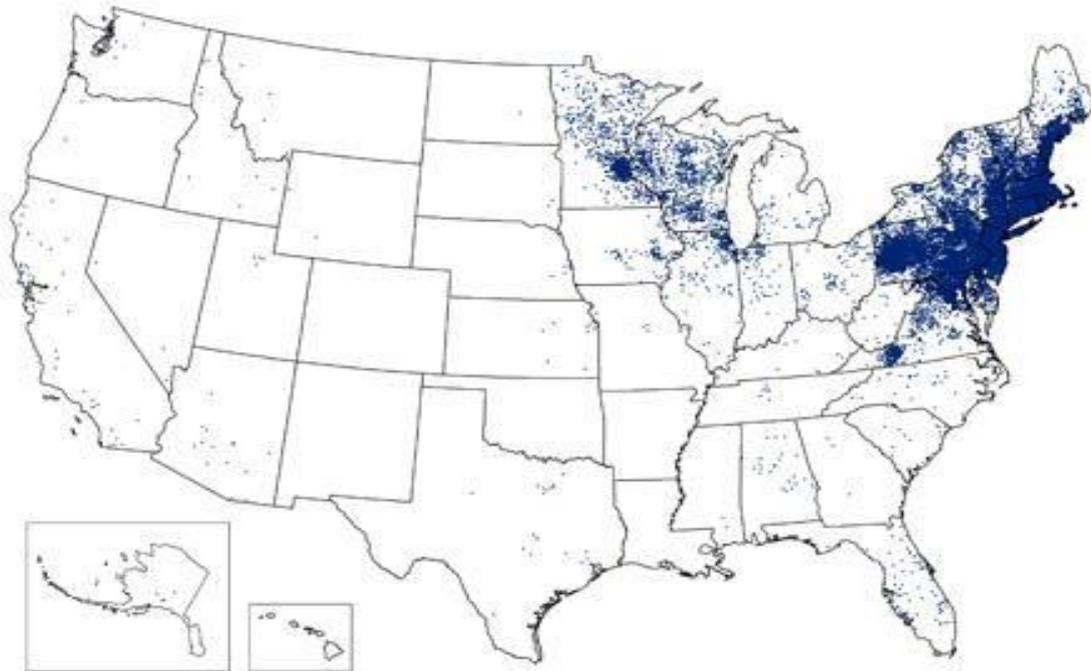


1 dot placed randomly within county of residence for each reported case



# Lyme disease cases 2014

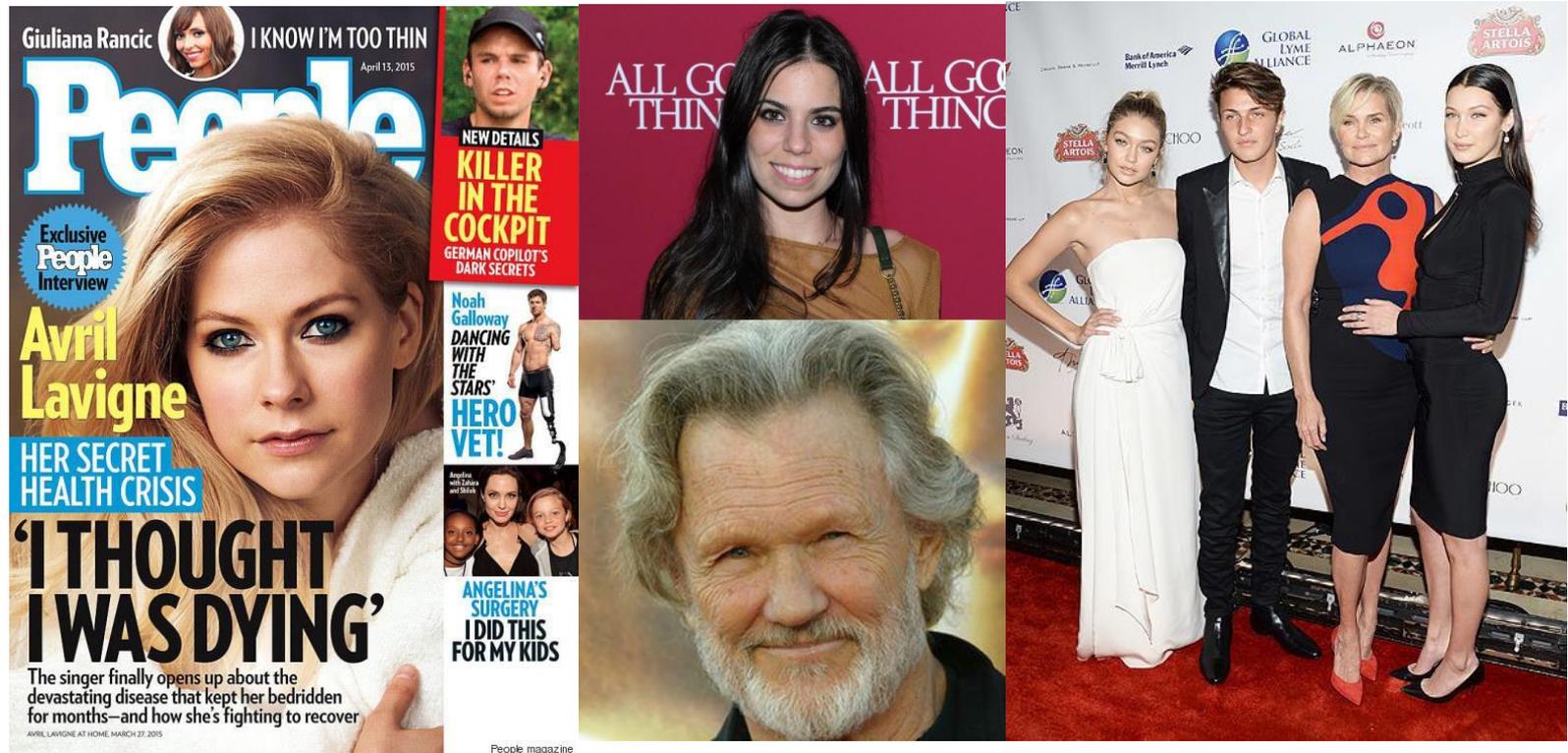
Reported Cases of Lyme Disease -- United States, 2014



1 dot placed randomly within county of residence for each confirmed case

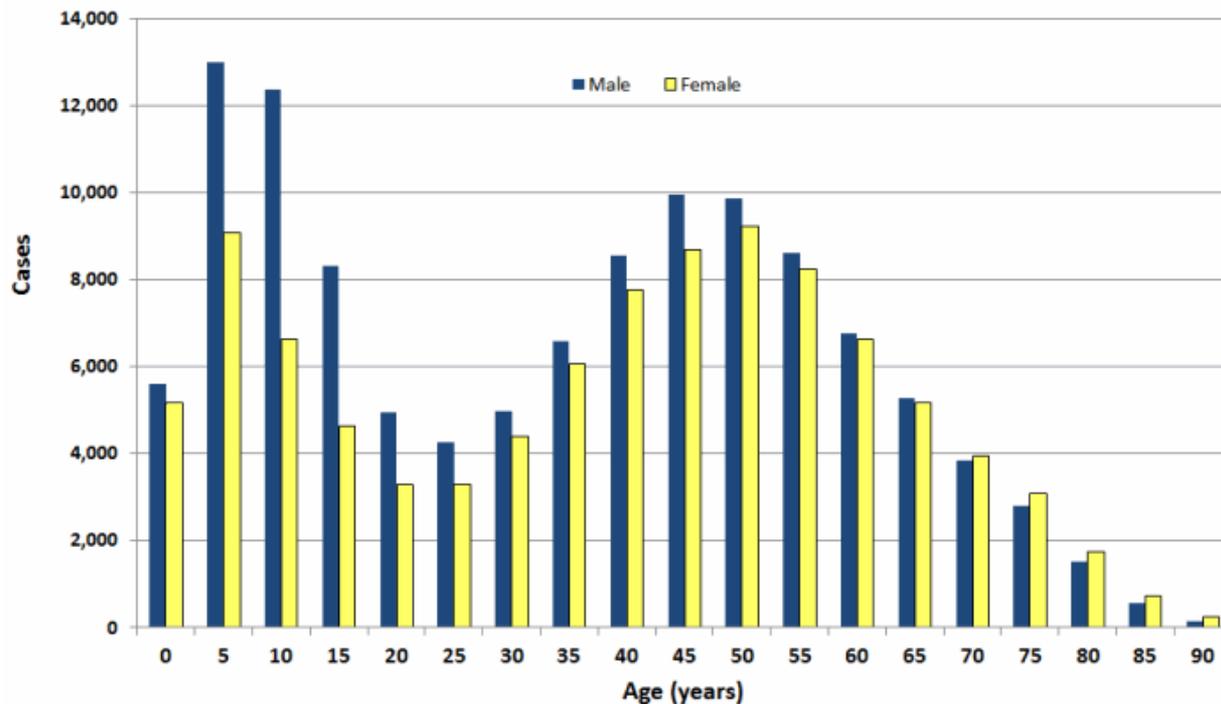


# Celebrities with Lyme disease



# Who gets tick-borne diseases? Everyone.

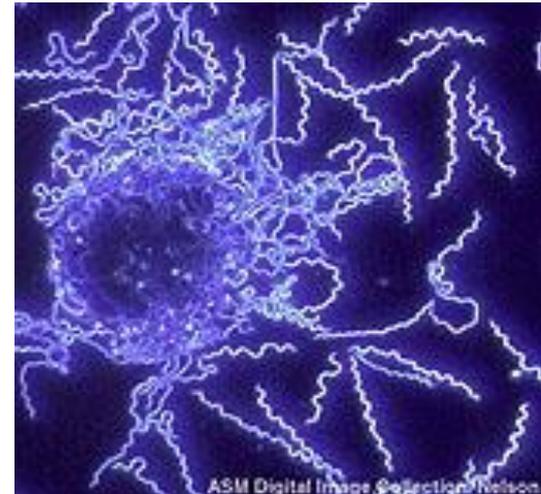
Confirmed Lyme disease cases by age and sex--United States, 2001-2010



# What exactly is Lyme disease?

Lyme disease is a bacterial infection caused by the spirochete *Borrelia burgdorferi*.

- This organism attacks various organ systems in the body:
  - Nervous System
  - Activity System
  - Circulatory System



# Early Lyme disease symptoms

Symptoms typically appear 2-30 days after the bite of an infected tick.

Early symptoms:

- Expanding "bull's-eye" rash
- Flu-like Symptoms
- Fever
- Malaise
- Fatigue
- Headache
- Muscle aches
- Joint aches



# Examples of the "bull's-eye" rash:



L. Zemel



S. Luger



J. Stratton



A. McDonald

\*Photos provided by [Pfizer](#)

# Later signs and symptoms

- Severe headaches and neck stiffness
- Additional rashes
- Arthritis
- Facial or Bell's palsy
- Intermittent pain
- Heart palpitations or an irregular heart beat (Lyme carditis)
- Episodes of dizziness or shortness of breath
- Inflammation of the brain and spinal cord
- Nerve pain
- Shooting pains, numbness, or tingling
- Problems with short-term memory



*Swollen knee of a youth with Lyme arthritis.*

Source: National Library of Medicine

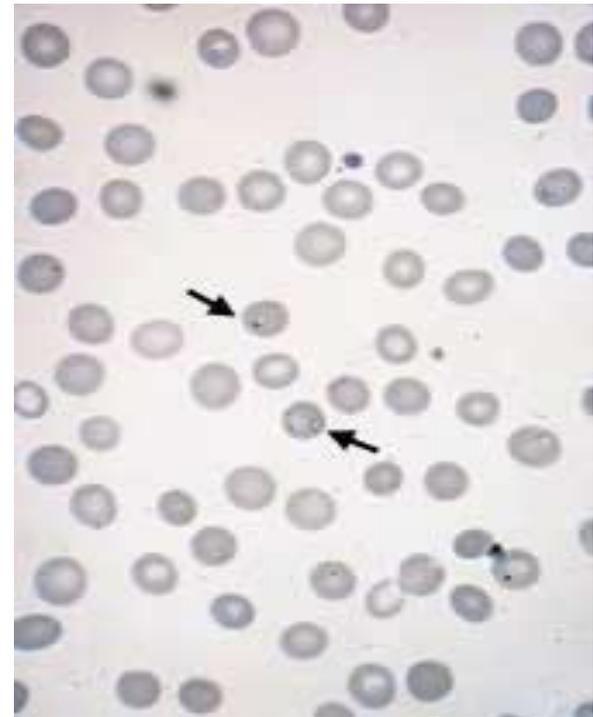
## How is Lyme disease diagnosed?

Lyme disease is diagnosed based on symptoms, physical findings (e.g., rash), and the possibility of exposure to infected ticks; laboratory testing is helpful if used correctly.



# What is babesiosis?

A malaria-like illness caused by a protozoan called *Babesia microti*. This parasite invades and lives within red blood cells.



<http://www.aafp.org>

Arrows indicate infected RBCs

Symptoms are mostly nonspecific, and the illness can range from very mild to very severe; although most people will not have symptoms.

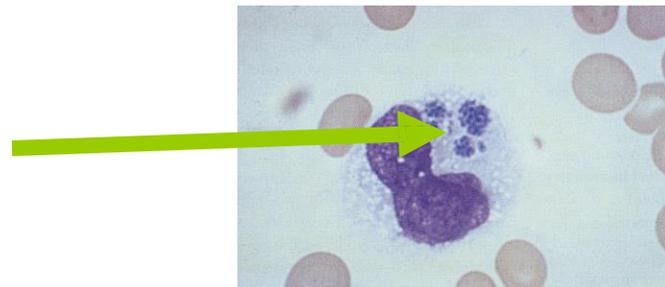
Symptoms may include:

- Fever
- Drenching sweats
- Muscle or joint aches or pains
- A blood test may find a breakdown of the red blood cells called hemolytic anemia

# What is anaplasmosis?

Anaplasmosis was formerly known as human granulocytic ehrlichiosis (HGE). These bacteria invade and live in white blood cells called granulocytes.

Note the clumps of Ehrlichia in a white blood cell



Much like babesiosis, symptoms are mostly nonspecific, and the illness can range from very mild to very severe. Most patients will experience:

- Rapid onset of fever
- Shaking
- Chills
- Muscle or joint pain
- Severe headache

Each tick-borne disease has its own test and may have a different treatment protocol.

# Are there any vaccines?

- There was a vaccine for Lyme disease several years ago, but it is no longer available
- If you were previously vaccinated for Lyme disease you are **NO LONGER** protected
- There are no vaccines available for any of the tick-borne diseases, so **PREVENTION** is key

# What do blacklegged ticks look like?



©2005 M. Plonsky

## It varies based on their stage...

- Adult Female: Reddish body size comparable to a sesame seed
- Adult Male: Slightly smaller than female, completely dark brown
- Nymph: Size comparable to that of a poppy seed
- Larva: Size smaller than that of a pin head
- Larvae may not transmit Lyme, but do transmit other diseases.



From left to right: Adult female, adult male, nymph, larva

# The two year tick life cycle

Year One

Year Two

Spring

Summer

Autumn

Winter

Spring

Summer

Autumn

Winter

eggs

larvae

nymphs

adults

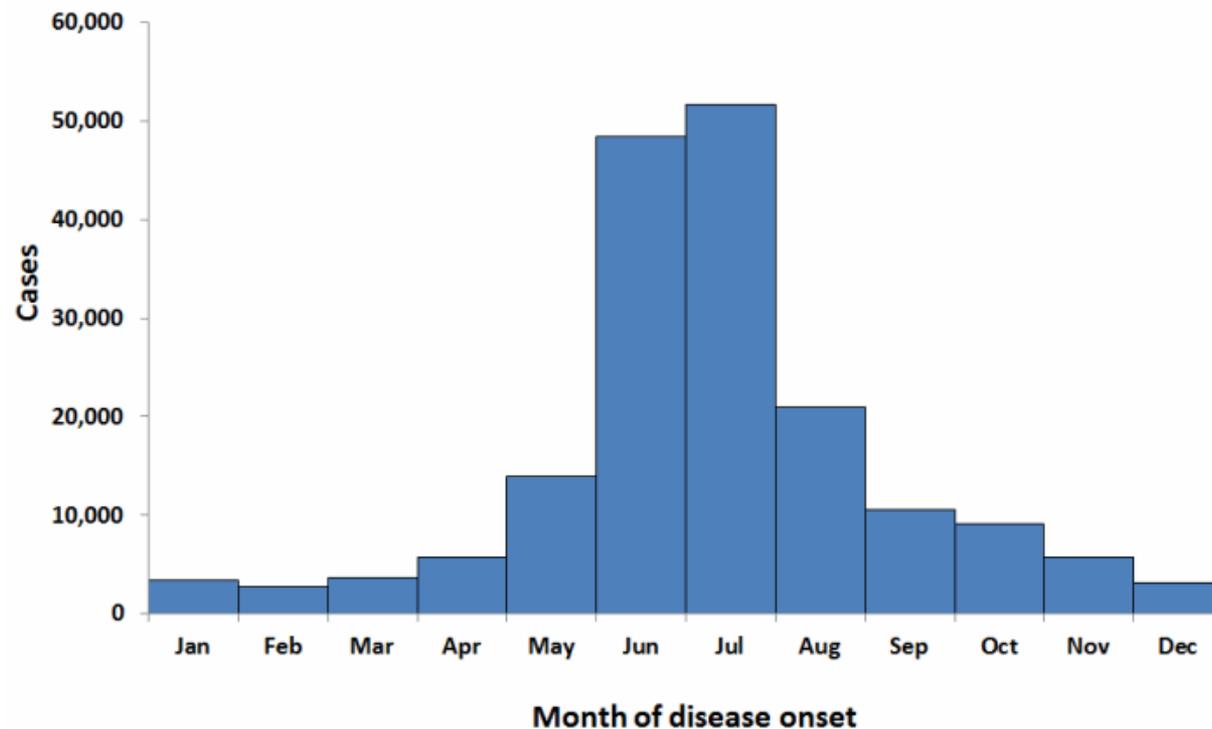


Adults mate,  
produce eggs & die

Source: Center for Vector-Borne Disease, University of Rhode Island

# When are you most likely to get Lyme disease?

Confirmed Lyme disease cases by month of disease onset--United States, 2001-2010



# Where do ticks live?

Ticks thrive in shady, moist areas.



**Engorged blacklegged ticks may fool you.**

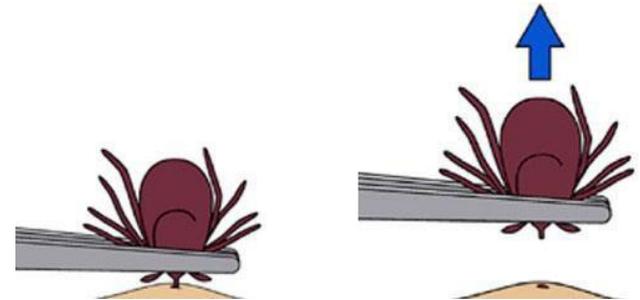


# Ticks attach with a unique mouthpart



# What's the best way to remove a tick?

- Use fine-tipped tweezers.
- Grasp the tick by the mouthpart close to the skin.
- Pull straight back with a slow, steady force.
- Avoid crushing the tick's body.
- Place tick in a plastic vial or zip-lock bag for testing.
- Wash area and disinfect the bite site.
- Record the date and location of the bite.
- Watch for early symptoms.



# Tick Removal DON'Ts

- Don't squeeze or rupture the tick.
- Don't pour kerosene or nail polish remover on the tick.
- Don't rub Vaseline or Petroleum Jelly on the tick.
- Don't do ANYTHING that might otherwise traumatize the tick.

# Where do you send a tick for testing?

- Check with your local Health Department to see if they identify and/or test ticks.
- UMass Amherst Laboratory of Medical Zoology and University of Connecticut Veterinary Medical Diagnostic Laboratory identify and test ticks for a fee.
- University of Rhode Island Tick Encounter Resource Center and University of Maine Cooperative Extension Service identify ticks for free.
- Some private labs will test ticks for a fee.

**Don't wait for tick-testing results if you suspect that you have contracted a tick-borne disease. See your physician immediately!**

**How do you avoid getting a tick bite?**



**B**LAST

# Bathe or shower soon after coming indoors.

Bathing or showering within 2 hours of outdoor activity helps remove ticks that haven't attached.



**BLAST**



## Look for ticks and rashes.

Tick bites are usually painless, therefore most people are unaware when they have a tick attached to them.



- Ticks are very small, and may feed anywhere on the body, so check thoroughly.
- Check under your arms, in your ears, the belly button and behind your knees.
- Do a tick check every night.

**BLAST**

# Apply repellents.

## SKIN

If you choose to use a tick repellent on your skin, the CDC recommends using a product that contains *DEET* at a concentration of at least 20%.

## CLOTHING

A *permethrin* based product is recommended for clothing and gear. It provides great protection against ticks!



Treat your clothing with permethrin



Read instructions

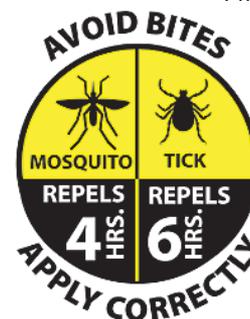


Apply in ventilated area



Hang to dry

Photos CDC



# Testing natural products to repel or kill ticks

- 2-undecanone
- Garlic oil
- Nookatone
- Mixed Essential Oils  
rosemary, thyme,  
lemongrass, geranio
- Fungus



**BLAST**

# Spray the edges of your yard.



- A single *perimeter* spray for tick control once in the Spring can reduce the number of ticks in your yard by up to 80-90%.
- If you decide to spray your yard, it is best to hire a licensed professional who is trained to do this job efficiently and safely.

# Create a “Tick-Safe” zone.



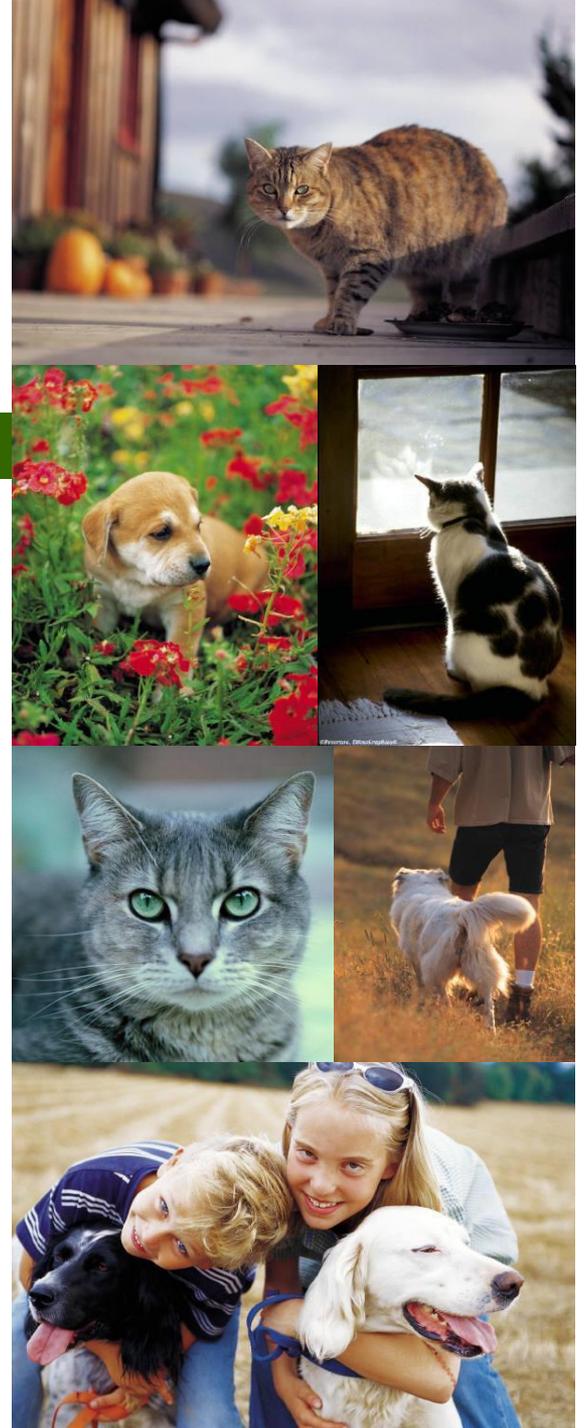
Westport/Weston Health District

- Clear tall grasses and brush.
- Add a 3-ft wide barrier of wood chips or gravel between lawns and wooded areas.
- Mow the lawn frequently.
- Keep leaves raked.
- Stack wood neatly in a dry area.
- Keep playground equipment and patio furniture away from yard edges and in a sunny location.
- Choose deer resistant plants.
- Avoid feeding wild animals & birds.

**BLAST**

# Treat your pets.

- Check your pets for ticks after coming indoors.
- Ask your vet about vaccines and products that will help your pet repel ticks.
- Don't sleep with your pet because ticks on your pet may crawl on to you.



# Join our team and help tackle tick-borne diseases!



# Information provided by:

- Centers for Disease Control and Prevention (CDC)
- CT Agricultural Experiment Station
- CT Department of Public Health
- Westport/Weston Health District
- Yale School of Public Health

*Peridomestic Lyme Disease Prevention:*

*Results of a Population-Based Case–Control Study*

Neeta P. Connally, PhD, Amanda J. Durante, PhD, Kimberly M. Yousey-Hindes, MPH,  
James I. Meek, MPH, Randall S. Nelson, DVM, Robert Heimer, PhD